

# CHAPTER 9

## TILE ROOFING

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### Section I. DESCRIPTION AND GENERAL DISCUSSION

#### 9.1.1 General

Most roofing tiles are clay or shale products that are burned to a hard, dense structure, with or without a glazed exposure surface. A few cement tiles have been produced.

#### 9.1.2 Sloping Roofs

Several types of tiles are used for sloping roofs, namely, shingle, Spanish, mission and interlocking, but in these general types there are many variants in size, form, and color. Minimum slope should be 4-inches per foot.

#### 9.1.3 Promenade Tile

The so-called promenade tiles used for surfacing

flat, built-up roofs that are subjected to traffic are usually square-edged shale tile not less than  $\frac{3}{4}$  inches thick.

#### 9.1.4 Weights

Tile roofs are extremely heavy, ranging in weight from 800 to 1800 pounds per square; consequently, they require very strong framing to support them.

#### 9.1.5 Fire Classification

Roofing tiles are not classified as to resistance to fire by the Underwriter's Laboratories, Inc., but since they are fireproof, they should be rated at least equal to asbestos-cement and slate roofings.

### Section II. DECKS FOR TILE ROOFS

#### 9.2.1 Sloping Decks

Wood decks for tile roofs may be of well-seasoned sheathing lumber, tongued-and grooved and not more than 6 inches wide or plywood with exterior glue. Sheathing boards should be fastened to each rafter with two nails to form a smooth, even surface. The roof deck should be covered with 30-pound asphalt-saturated felt prior to laying the tiles. Concrete decks with nailing strips and nailable concrete decks are also used.

#### 9.2.2 Flat Decks

Promenade tile on flat decks are laid over a conventional asphalt or coal-tar-pitch built-up roof, usually consisting of a coated base sheet plus three or more plies of saturated felt, with a final mopping of 25 pounds per 100 square feet of asphalt or

coal-tar pitch instead of the usual heavy pouring of bitumen specified for roofs surfaced with slag or gravel. A coal-tar-pitch built-up membrane is preferred for dead level decks. Promenade tiles should be laid in a bed of portland cement mortar (1 to 3) approximately 1 inch thick. It is good practice to separate the setting bed from the underlying built-up roofing by a drainage course of crushed stone or gravel. Joints should be  $\frac{3}{16}$  to  $\frac{1}{4}$  inch wide, filled flush with portland cement mortar (1 to 2). Expansion joints,  $\frac{3}{4}$  inches wide, filled with a waterproofing calking compound, should be provided on 10-foot centers and at skylights, curbs and walls. Expansion joints should extend from the top of the tile through the cement mortar to the top of the drainage bed. Finished surfaces should be sloped for drainage.

### Section III. STORAGE AND HANDLING OF TILES

Store and handle roofing tiles as described in

section III, chapter 8, "Storage and Handling of Slates."

## Section IV. DETERMINING TREATMENT FOR TILE ROOFS

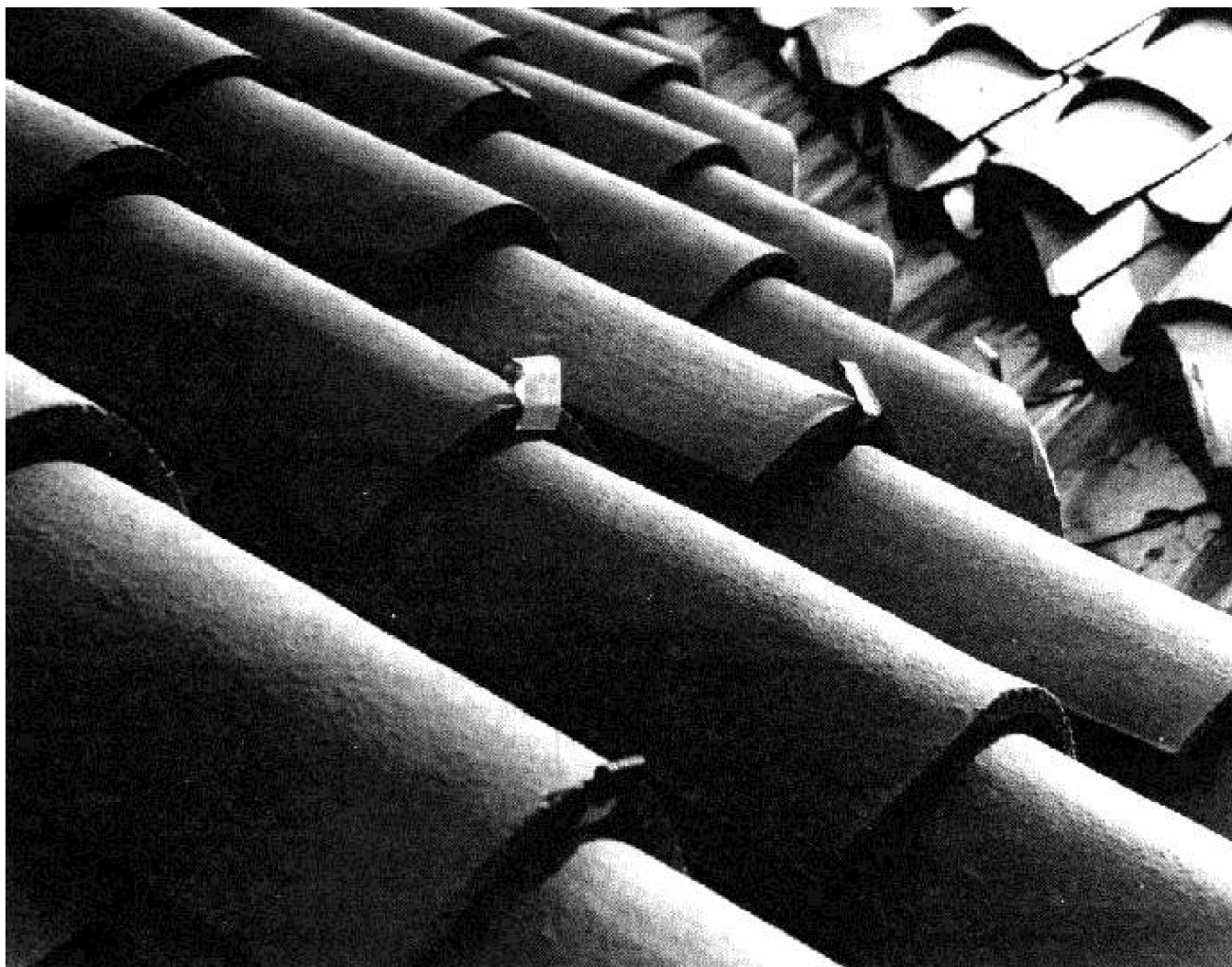
### 9.4.1 Sloping Roofs

Mechanical damage, such as that from hail, traffic, tree limbs, etc., and failure of fasteners constitute the principal causes of maintenance and repair work on tile roofs. The principles that determine the treatment for sloping tile roofs are essentially the same as those for determining the treatment of slate roofs, except that occasionally, after very long period of service, tile roofs that are in otherwise satisfactory condition may leak because of the disintegration of the felt underlayment.

### 9.4.2 Flat Roofs With promenade Tile

The most frequent cause of maintenance or repair work on a promenade tile roof is that necessitated by too few expansion joints between the promenade tile or by permitting the expansion joints to become filled with nonresilient material. Leaks through promenade decks are likely to be the result of a break in the waterproof membrane of flashing. If a deck is leaking, it is necessary to remove sufficient tile and setting bed to find the break in the membrane and repair it. Maintenance and repair methods for the built-up roof membrane are discussed under Built-up Roofing.

## SECTION V. MAINTENANCE AND REPAIR METHODS—TILE ROOFS



*Figure 38. Replaced tiles fastened in place with metal strips.*

Maintenance and repair methods for tile roofs are treated under one heading since no clear-cut distinction can be made between them.

### 9.5.1 Sloping Roofs

Replace broken shingle tiles with new ones by the method described for replacing broken slates, section V, chapter 8. Replace broken Spanish or mission tiles by troweling portland cement mortar on the new tile surface that will be lapped by the tile in the course above and on the surface that will lap the tile in the course below. Fasten the new tile in place with a metal strap or wire (fig. 38). Interlocking tiles use special fastenings and are replaced easily. It is sometimes impossible to match the exact shape or color of very old tiles. When a

number of buildings are roofed with the same kind of old tiles, it may be necessary to reroof the first with new tiles that match the old as nearly as possible, keeping sound tiles salvaged from the first roof to patch the other roofs and to replace tiles broken when the other roofs need to be reroofed.

### 9.5.2 Promenade Tile on Flat Decks

When insufficient expansion joints cause raising of the promenade tile, new joints should be installed. Expansion joints of 10-foot centers and at skylights, curbs, and walls are considered adequate. If expansion joints have become filled with nonresilient material or if the expansion joint material has deteriorated, it should be raked out and new material installed.

## Section VI. REROOFING SLOPING ROOFS WITH TILE

### 9.6.1 Preparing Deck

Existing roofing should be removed and the roof deck restored to as nearly "new" condition as practicable by removing rotted or warped sheathing boards and replacing them with new ones, and applying a 30-pound asphalt-saturated felt horizontally, with a 4-inch headlap and a 6-inch side lap. Secure the felts along laps and exposed sheets with large-headed roofing nails as necessary to hold it in place until the tile is laid.

### 9.6.2 Applying Tile Roof

*9.6.2.1 Mission and Spanish Tiles.* Nailing strips for mission and spanish tile should be pressure treated with wood preservative. Lay tiles with open valleys. Set eaves closures back 2 inches from the lower edge of eave. Lay pan tiles with uniform exposures to the weather. Lay cover tiles in a uniform pattern, except where otherwise necessary to match existing roofs. Give all tiles a minimum lap of 3 inches and extend pan tiles 1 inch over rear edge of gutter. Cut tiles to meet projections with finished joints and point up with roofer's cement. Waterproof the spaces between

field tiles and wood nailing strips at ridges and hips with a fill of roofer's cement. Fit all tiles properly and then secure them with nails long enough to penetrate at least 1 inch into the wood base. Match the tile courses on dormer roofs with those on the main roof. Where winds of hurricane intensity can be expected, consideration should be given to reinforcing tile roofs by laying all field tiles in portland cement mortar. To do this, fill the ends of tiles at eaves, hips, ridges, solid with cement mortar and fill the full width of laps between the tiles, both parallel and perpendicular to the eaves, with cement mortar.

*9.6.2.2 Slab Shingle Tiles.* Lay slab shingle tiles with a 2-inch headlap and secure each tile with two large-head roofing nails. Double the tiles at the eaves and project them 1 inch over the rear edge of gutters. Lay all tiles within 1 foot of hips, ridges, and abutting vertical surfaces in roofer's cement. Lay 10 or 12 inch tiles with 1 inch headlap on sides of dormers. Match the tile courses on dormer roofs with those on the main roof. Lay tile roofs with open valleys.